Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1-28. (Canceled)

29. (Previously Presented) A method of forming a fuel cell, comprising the steps of:

forming a first aperture defined by a first aperture surface through a first electrode layer;

forming a second aperture defined by a second aperture surface through a second electrode layer;

providing a proton exchange membrane;

providing an adhesive between the first electrode layer and the proton exchange membrane and between the second electrode layer and the proton exchange membrane;

providing a conductive layer on the first electrode layer and/or a conductive layer on the second electrode layer, wherein the conductive layer on the first electrode layer covers at least part of the first aperture surface; and

sandwiching the proton exchange membrane and the adhesive between the first electrode layer and the second electrode layer, where the first aperture of the first electrode layer is at least partially aligned with the second aperture of the second electrode layer, thereby exposing the proton exchange membrane.

30. (Previously Presented) A method according to claim 29 wherein the proton exchange membrane includes a catalyst.

31. (Previously Presented) A method according to claim 30 wherein the proton exchange membrane includes a perfluorosulfuric acid membrane with a polytetrafluoroethylene backbone.

32. (Previously Presented) A method according to claim 31 wherein the catalyst includes carbon/platinum.

33. (Previously Presented) A method according to claim 29 wherein the first electrode layer is conductive.

34. (Previously Presented) A method according to claim 33 wherein the second electrode layer is conductive.

35. (Canceled)

36. (Previously Presented) A method according to claim 29, wherein the step of providing a conductive layer includes providing the conductive layer on at least a portion of the first electrode layer and/or at least a portion of the second electrode layer after the aperture forming steps.

37. (Previously Presented) A method according to claim 29, wherein the step of providing a conductive layer includes providing the conductive layer on the first electrode layer and the second electrode layer, wherein the first and second electrode layers are substantially non-conductive.

38. (Canceled)

39. (Previously Presented) A method according to claim 37 wherein the conductive layer on the second electrode layer covers at least part of the second aperture surface.

40. (Previously Presented) A method according to claim 37 wherein the conductive layer on the first electrode layer extends through the first electrode layer.

41. (Previously Presented) A method according to claim 40 wherein the conductive layer on the second electrode layer extends through the second electrode layer.

42. (Previously Presented) A method according to claim 29 wherein the first electrode layer is conductive.

43. (Previously Presented) A method according to claim 42 wherein the second electrode layer is conductive.

44. (Previously Presented) A method according to claim 29 wherein the first electrode layer is substantially non-conductive, and includes one or more conductive feed-through contacts.

45. (Previously Presented) A method according to claim 44 wherein the second electrode layer is substantially non-conductive, and includes one or more conductive feed-through contacts.

46. (Previously Presented) A method according to claim 29 wherein the adhesive is conductive.

47. (Previously Presented) A fuel cell comprising:

a first electrode comprising:

a first electrode top surface;

a first electrode bottom surface;

a first electrode thickness defined by a first distance between the first electrode top surface and the first electrode bottom surface;

a first electrode aperture through the first electrode thickness defined by a first electrode aperture surface;

a second electrode comprising:

a second electrode top surface;

a second electrode bottom surface;

a second electrode thickness defined by a second distance between the second electrode top surface and the second electrode bottom surface;

a second electrode aperture through the second electrode thickness defined by a second electrode aperture surface;

a first conductive layer disposed on at least a portion of the first electrode top surface, at least a portion of the first electrode bottom surface, and at least a portion of the first electrode aperture surface;

a second conductive layer disposed on at least a portion of the second electrode top surface, at least a portion of the second electrode bottom surface, and at least a portion of the second electrode aperture surface;

a proton exchange membrane in electrical contact with and disposed between the first conductive layer and the second conductive layer;

wherein, the first electrode aperture is at least partially aligned with the second electrode aperture.

48. (Previously Presented) The fuel cell according to claim 47, wherein the proton exchange membrane includes a top catalyst layer and a bottom catalyst layer.

49. (Previously Presented) The fuel cell according to claim 47, wherein the proton exchange membrane has a thickness of 1 mil or less.

50. (Previously Presented) The fuel cell according to claim 47, wherein the first aperture surface defines a first aperture cross-sectional surface area of 1 mm^2 or less.

51. (Previously Presented) The fuel cell according to claim 47, wherein the first conductive layer has a thickness of 1000Å or less.

52. (Previously Presented) The fuel cell according to claim 47, wherein the second conductive layer having a thickness of 1000Å or less.

53. (Previously Presented) The fuel cell according to claim 47, wherein the first electrode thickness and the second electrode thickness are 2 mil or less.

54. (Previously Presented) A method of forming a plurality of fuel cells, comprising the steps of:

providing a first length of material having a first plurality apertures and a first plurality of electrical contacts, wherein the first plurality of electrical contacts include one or more conductive feed-through contacts that extend through the first length of material;

providing a second length of material having a second plurality apertures and a second plurality of electrical contacts;

providing a proton exchange membrane;

providing an adhesive layer between the proton exchange membrane and the first length of material, between the proton exchange membrane and the second length of material, or between the proton exchange membrane and the first and second length of material; and

sandwiching the proton exchange membrane and the adhesive between the first length of material and the second length of material, where the first plurality of apertures are at least partially in registration with the second plurality of apertures, and wherein at least part of the proton exchange membrane is aligned with the plurality of first and second apertures to form a plurality of fuel cells.

55. (Previously Presented) A method according to claim 54, further comprising the step of dicing the plurality of fuel cells into single fuel cells.

56. (Previously Presented) A method according to claim 54 wherein the first plurality of electrical contacts are positioned on a surface of the first length of material that is facing away from the proton exchange membrane.

57. (Canceled)

58. (Previously Presented) A method according to claim 56 wherein the second plurality of electrical contacts are positioned on a surface of the second length of material that is facing away from the proton exchange membrane.

59. (Previously Presented) A method according to claim 58 wherein the second plurality of electrical contacts include one or more conductive feed-through contacts that extend through the second length of material.

60. (Previously Presented) A method according to claim 54 wherein the adhesive is conductive.